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Conference Abstract

Phenological sensitivity to temperature at broad scales: opportunities and challenges of natural history collections

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Abstract

The seasonal timing of biological events (i.e. phenology) has been frequently observed to shift in response to recent climate change. While many of these events now occur earlier due to warmer temperatures, there is considerable variation in the direction and magnitude of these shifts across species. This variation could have consequences for species interactions and ecological communities, especially when the relative timing of key life cycle events among species is disrupted. As a first step to better understand the causes and consequences of variation in species' phenological responses to climate change, we used natural history collections to quantify and compare broad-scale patterns in phenology-temperature relationships for Canadian butterflies and their nectar food plants over the past century. The phenology of both groups advanced in response to warmer temperatures - both across years and sites. Across butterfly-plant associations, flowering time was significantly more sensitive to temperature than the timing of butterfly flight. However, the sensitivities were not correlated across associations. The findings we will present indicate that warming-driven shifts in the timing of species interactions are likely to be prevalent. The opportunities and challenges associated with using natural history collections for detecting and linking phenological responses to climate change will also be discussed.

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Keywords

phenology, climate change, species interactions, natural history collections

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